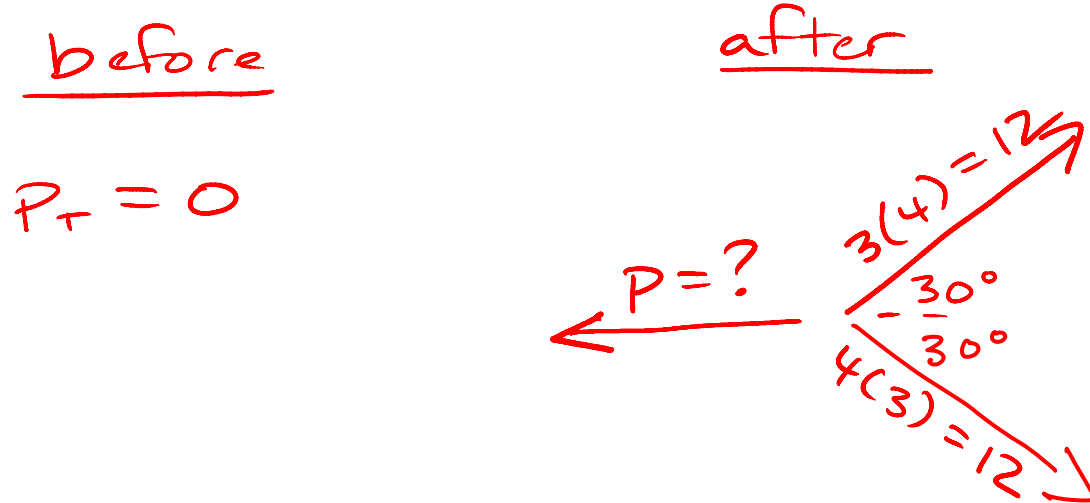
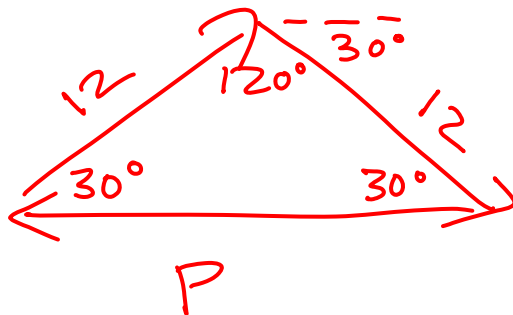


**Example #14:** An object, at rest, explodes into three pieces, each travelling parallel to the ground. The first piece has a mass of 3.0 kg and travels at 4.0 m/s ( $30^\circ$  N of E). The second piece has a mass of 4.0 kg and travels 3.0 m/s ( $30^\circ$  S of E). Find the speed and direction of the third piece if its mass is 5.0 kg.



$\Rightarrow$  vector-sum = a triangle:



$\Rightarrow$  isosceles triangle,  
so  $P$  is due west

$$\frac{\sin 30}{12} = \frac{\sin 120}{P}$$

$$P = 20.8 \frac{\text{kg} \cdot \text{m}}{\text{s}}$$

$$p = mv \quad 20.8 = 5v$$

$$v = 4.2 \text{ m/s due west}$$